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Towards Systemic Risk Management in the frame of Business Service Ecosystem

Christophe Feltus, François-Xavier Fontaine, Eric Grandry

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LIST

OUTLINE

LUXEMBOURG INSTITUTE OF SCIENCE AND TECHNOLOGY

- **The challenge**
  - Introducing the case study
  - The involved actors
- **The solution**
  - The domain metamodel
  - The risk metamodel
  - The ArchiMate language
- **How it works**
  - Paper files archiving services
  - Regulated Support-PFS services
- **Conclusion and future work**

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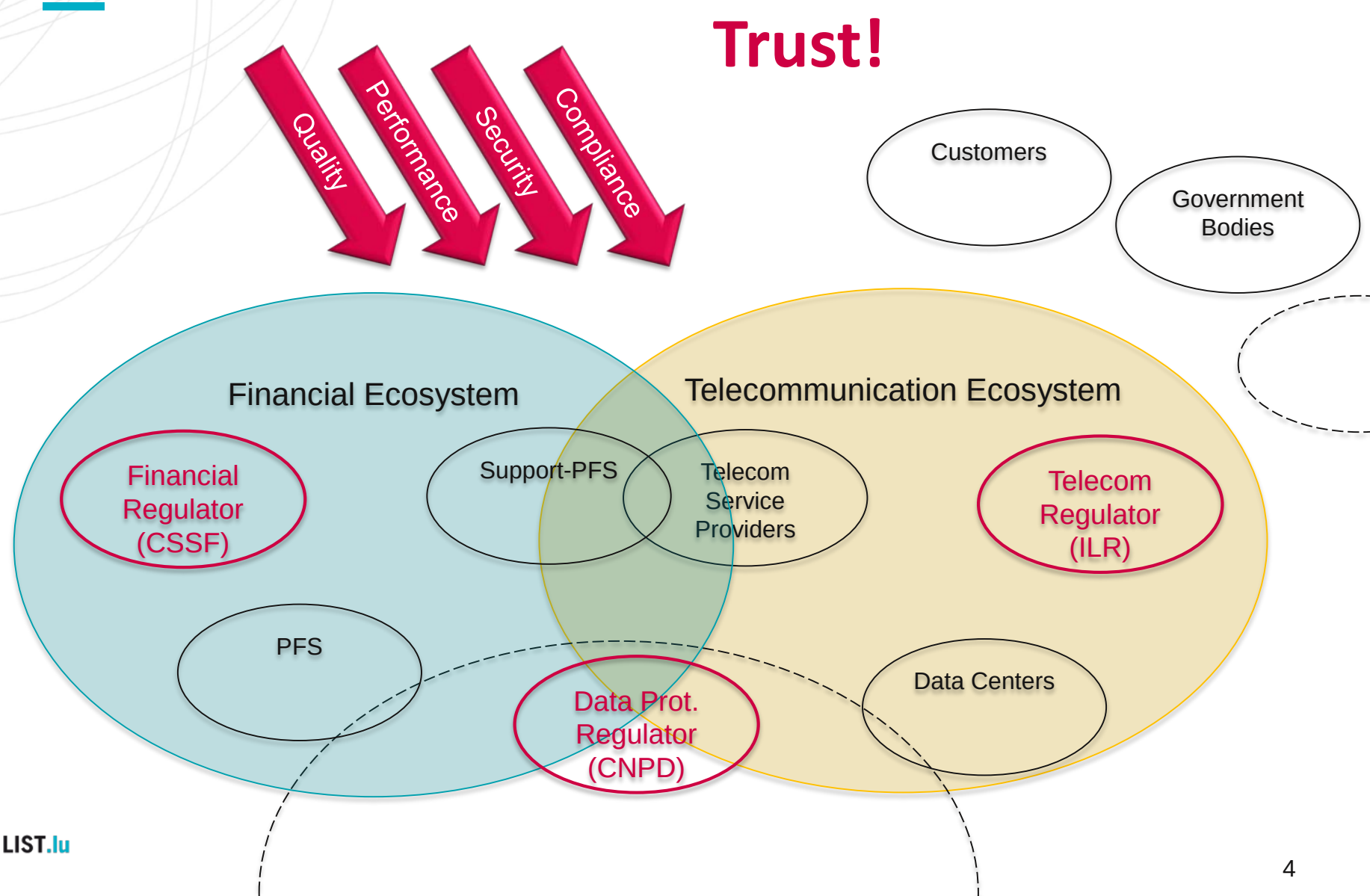
INTRODUCTION

Business Service Ecosystem



THE CASE STUDY

In July 2012, the circular CSSF 12/544 “Risk Based Approach” was released. Within the CSSF mission of protecting the stability of the financial sector and guaranteeing compliance with the applicable financial regulation, the aim of the circular is to **optimise the supervision framework** applicable to the Support-PFS by introducing the concept of “**Risk Based Approach**”.

Key points :

- The development and implementation of a specific **risk management system** within the Support-PFS
- The **self-assessment** of the entity’s risks
- The issuance of an annual **Risk Analysis Report** to the CSSF
- The issuance of an annual **Descriptive Report** to the CSSF

THE ACTORS

CSSF

The Commission de Surveillance du Secteur Financier is a public institution which supervises the professionals and products of the Luxembourg financial sector. It supervises, regulates, authorises, informs, and, where appropriate, carries out on-site inspections and issues sanctions. Moreover, it is in charge of promoting transparency, simplicity and fairness in the markets of financial products and services and is responsible for the enforcement of laws on financial consumer protection and on the fight against money laundering and terrorist financing.

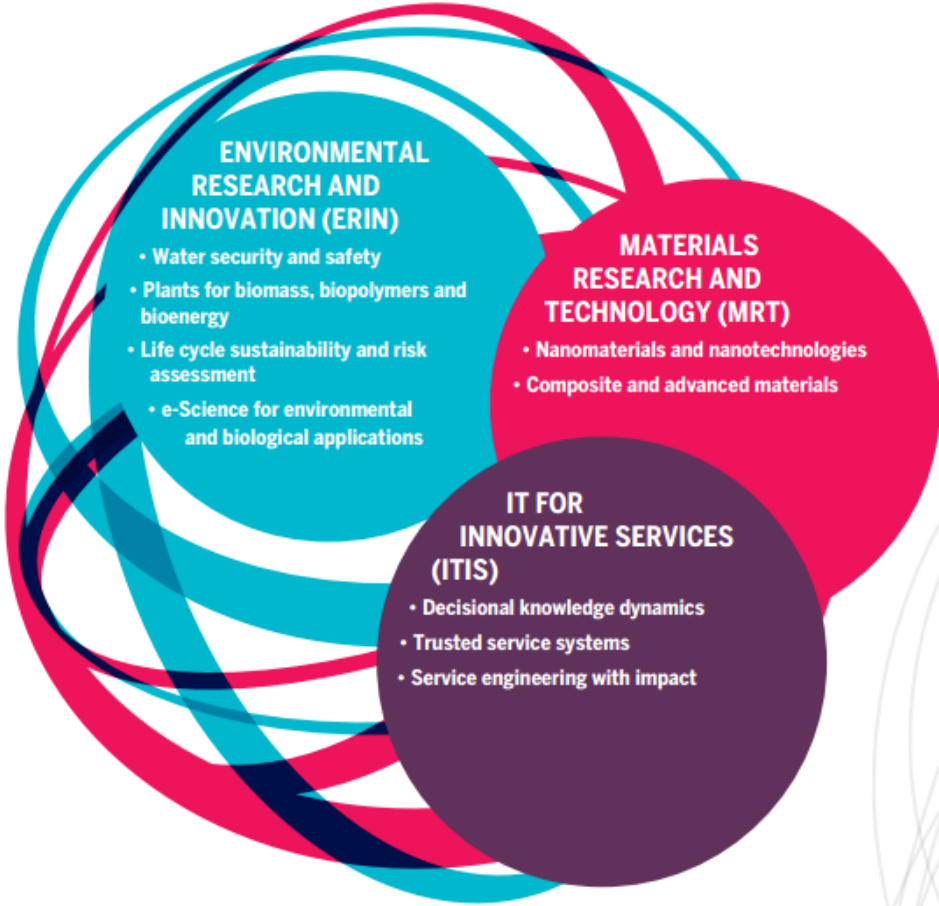
For more information: www.cssf.lu

THE ACTORS

LIST

A key player in research and innovation in Luxembourg, the Luxembourg Institute of Science and Technology (LIST) covers with its 630 employees the domains of materials, environment and IT. As an RTO (Research and Technology Organisation) and with its interdisciplinary impact-driven approach, LIST contributes to the development of Luxembourg's economy and society.

For more information: www.list.lu



MOTIVATION

Why did we accept this challenge?

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"Any organization where the operational activities of which are financed by external stakeholder may be considered as an enterprise."

Source: Capability-Based Business Model Transformation, Martin Henkel, Ilia Bider, Erik Perjons, ASDENCA 2014

- Extending the frontier of the system beyond the frontier of the enterprise
- Moving towards the systemic risk management

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SOLUTION

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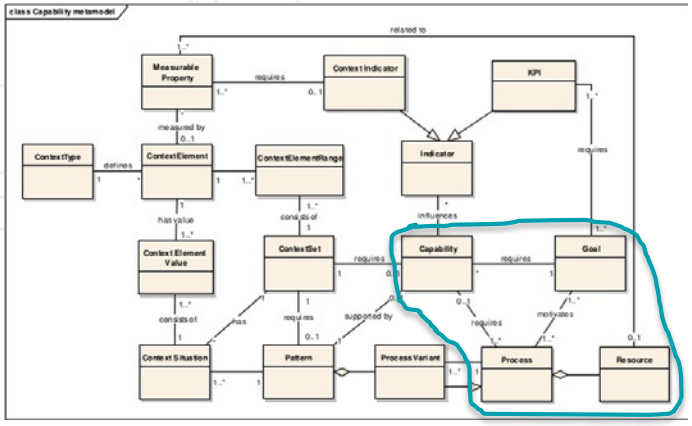
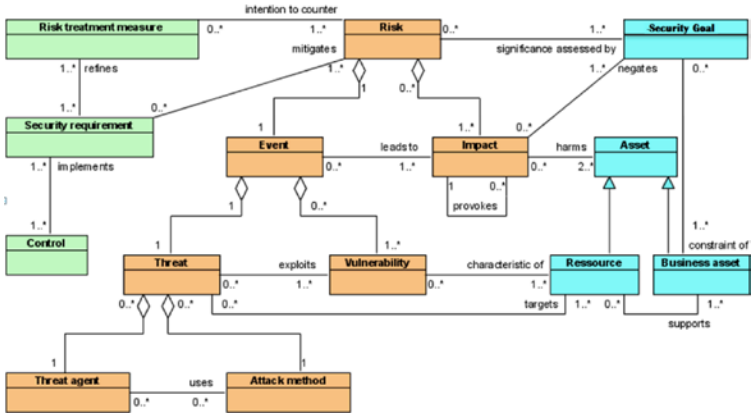
1) A metamodel for modelling the ecosystem capabilities and resources



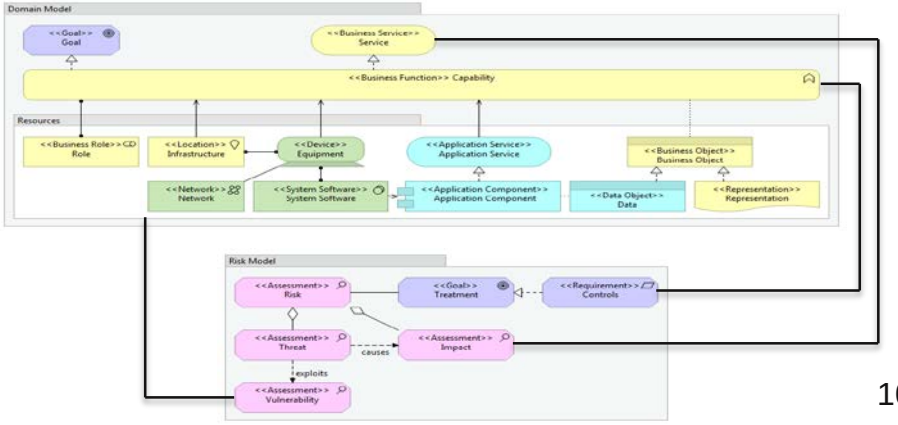
Sandkuhl, K., Koç, H.: On the Applicability of Concepts from Variability Modelling in Capability Modelling: Experiences from a Case in Business Process Outsourcing, ASDENCA 2014, Greece

2) A risk management approach based on the ISSRM metamodel



Mayer, N., Heymans ,P., Matulevicius, R.: Design of a Modelling Language for Information System Security Risk Management, RCIS, 2007

3) A language to sustain the systemic risk management



Grandry, E., Feltus, C., Dubois, E.: Conceptual Integration of Enterprise Architecture Management and Security Risk Management, SOEA4EE, EDOC WS, 2013

MODELLING THE ECOSYSTEM

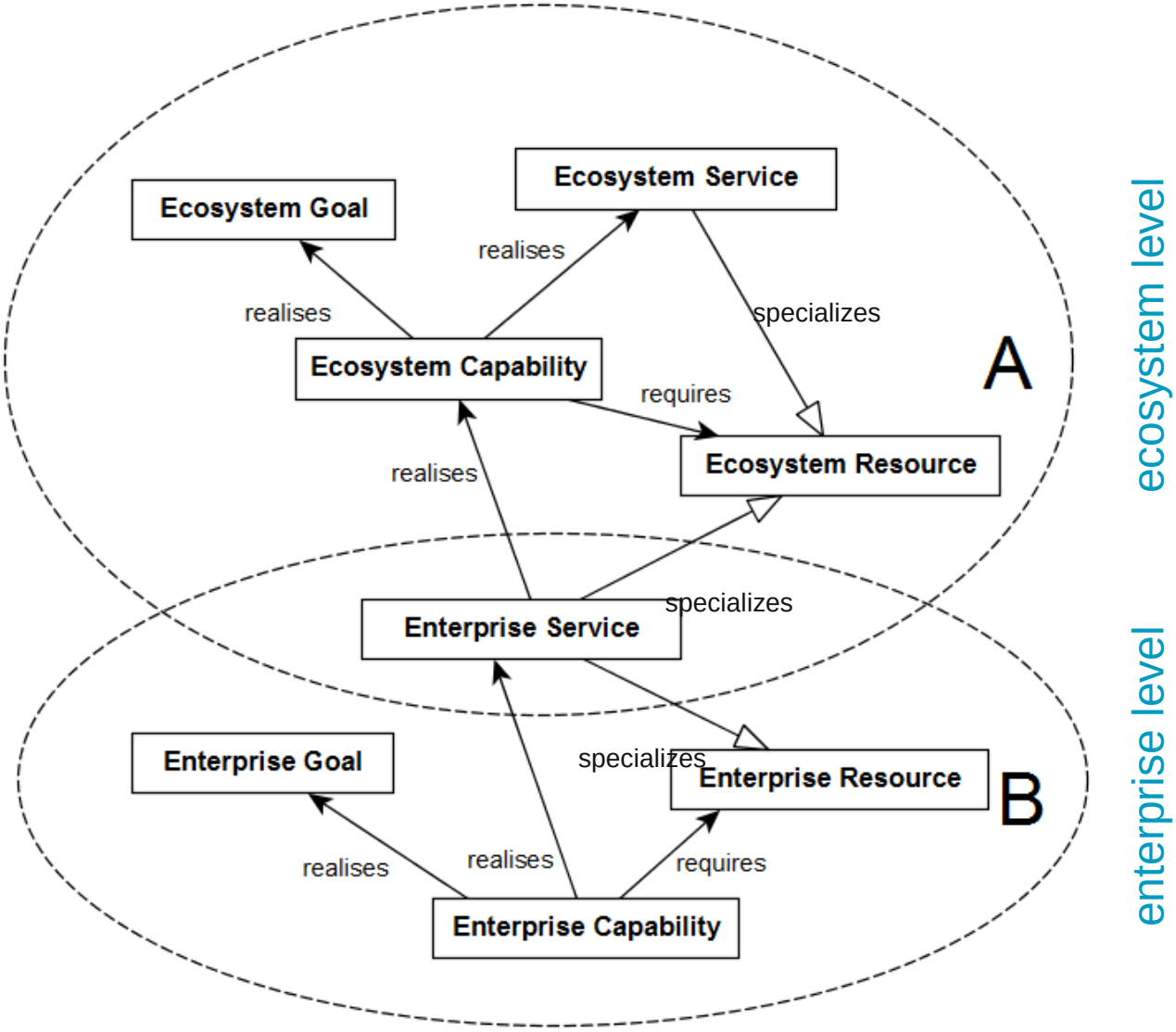
Business Service Ecosystem (BSE) Metamodel

Capability:
The ability and capacity that enable an enterprise to achieve a business goal in a certain context. (A: the ability to regulate the ecosystem) (B: capacity to provide financial advice)

Resource:
An asset that an organization has or can call upon. (A: employees that manage the ecosystem) (B: financial asset management software)

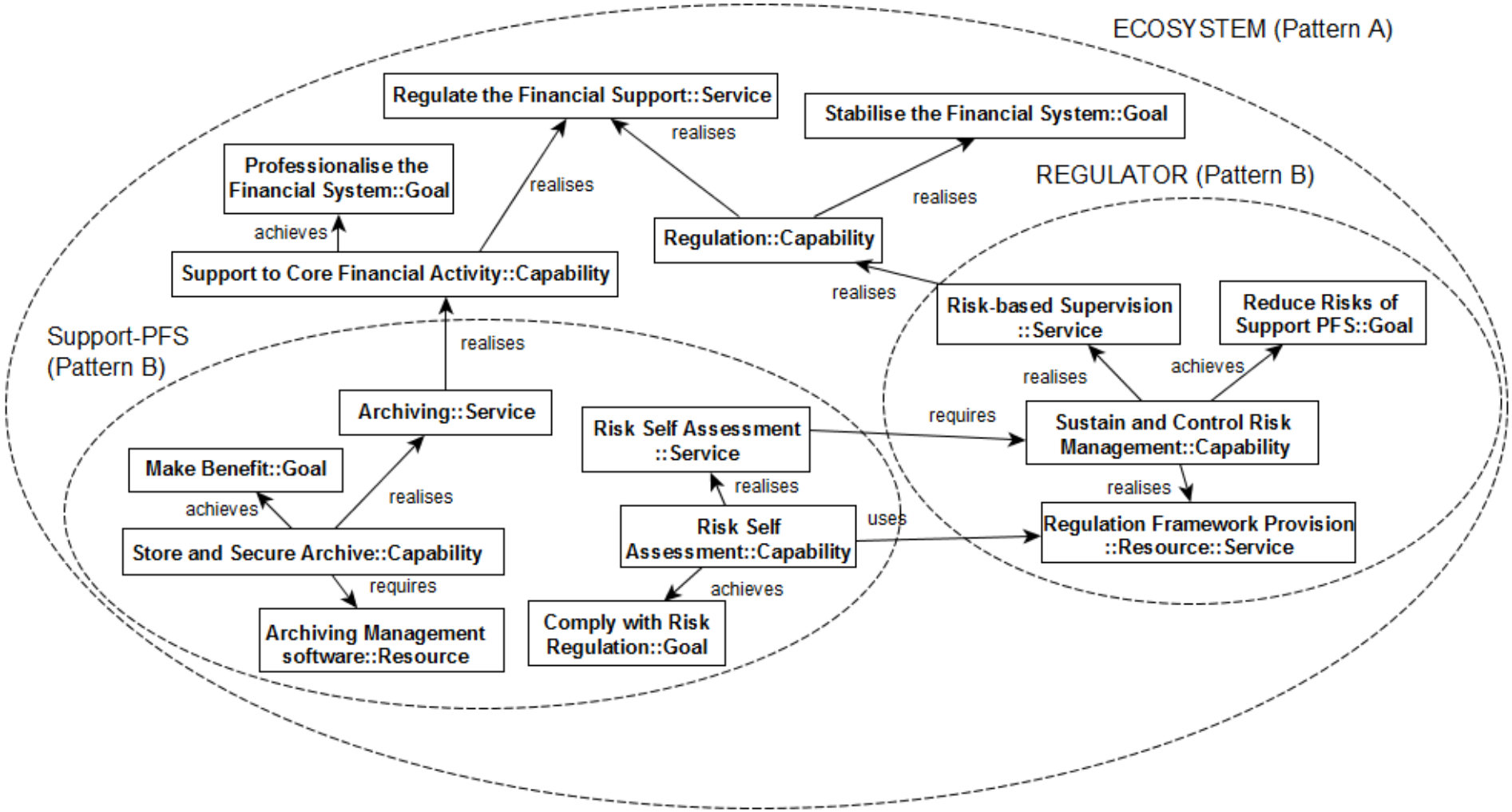
Goal:
A desired state of affairs that needs to be obtained. (A: guarantee the delivery of secure financial services) (B: make profits)

Service:
Acts performed for others, including the provision of resources that others will use.



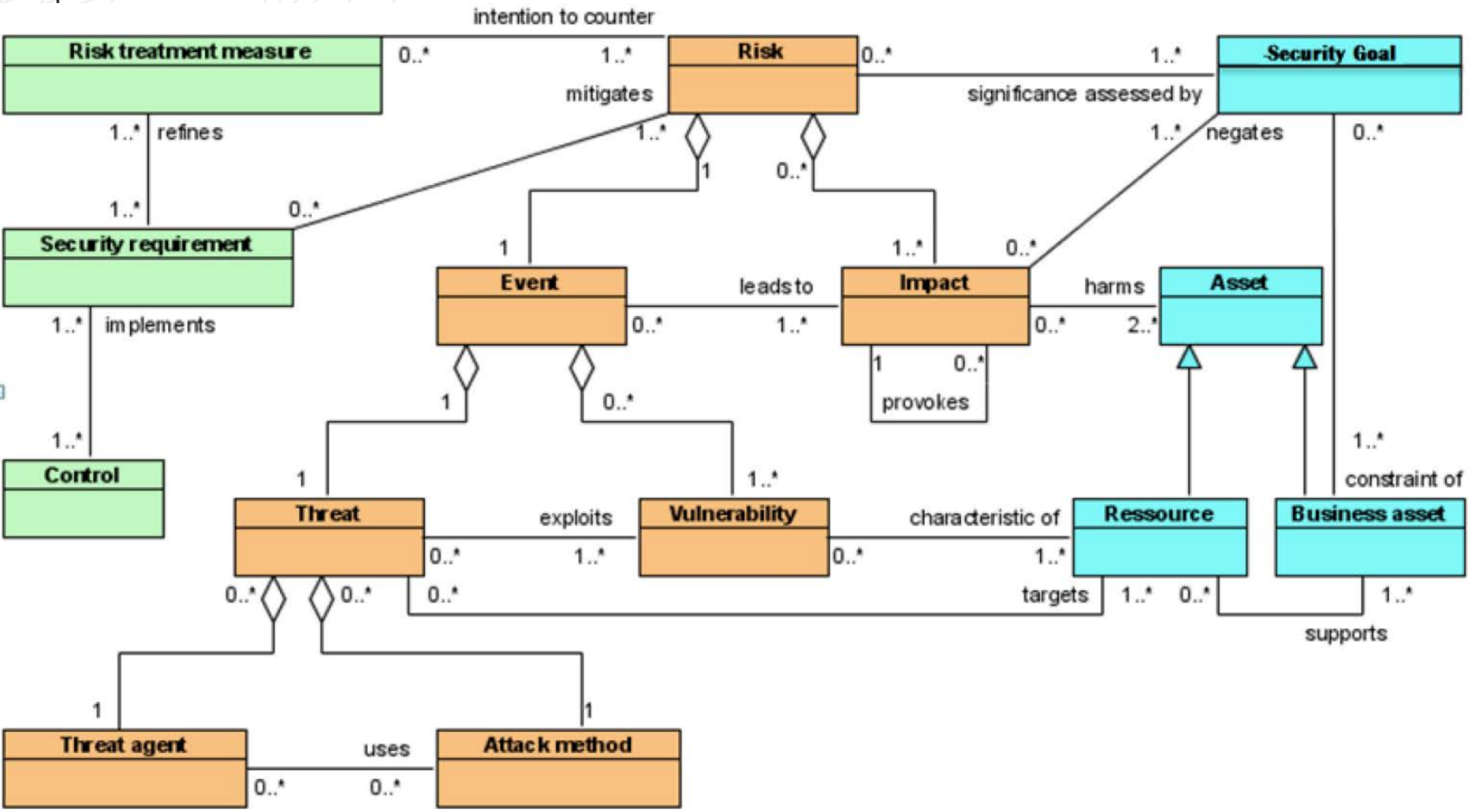
MODELLING THE ECOSYSTEM

BSE instantiated to the financial ecosystem



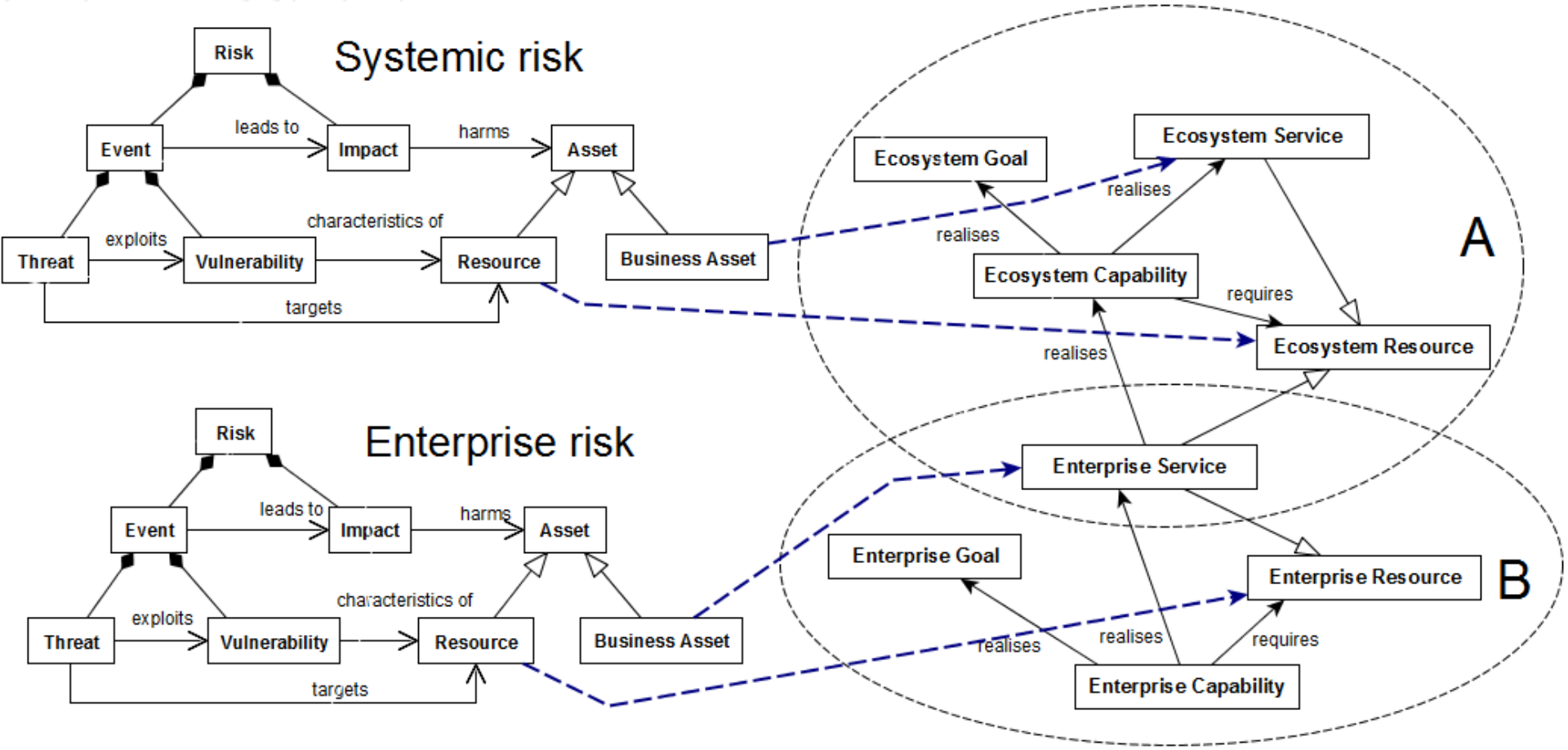
ISSRM

Information System Security Risk Management Model

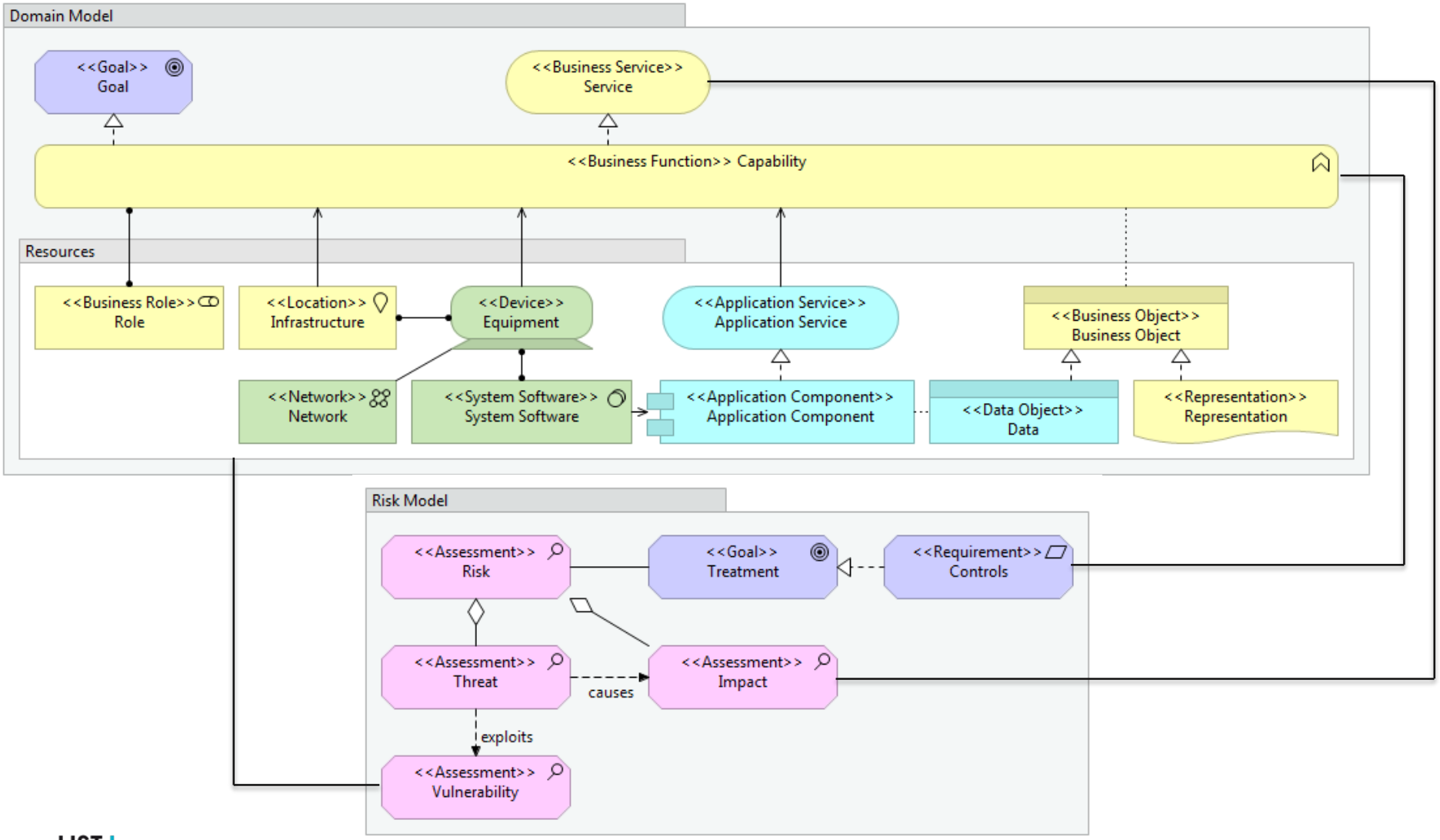


MODELLING THE RISKS

Mapping ISSRM – BSE metamodel



ARCHIMATE LANGUAGE



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ENTERPRISE RISK LANGUAGE

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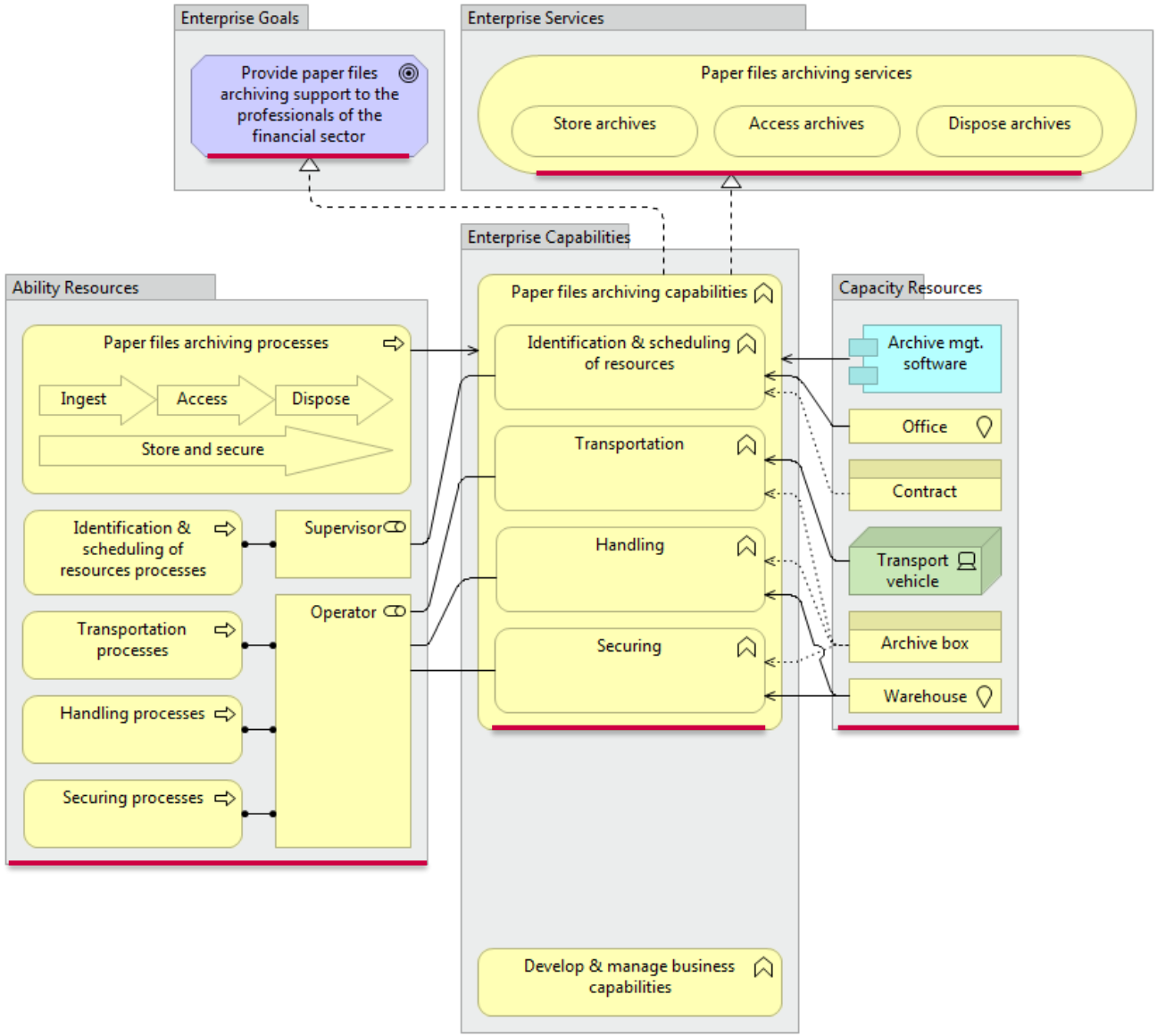
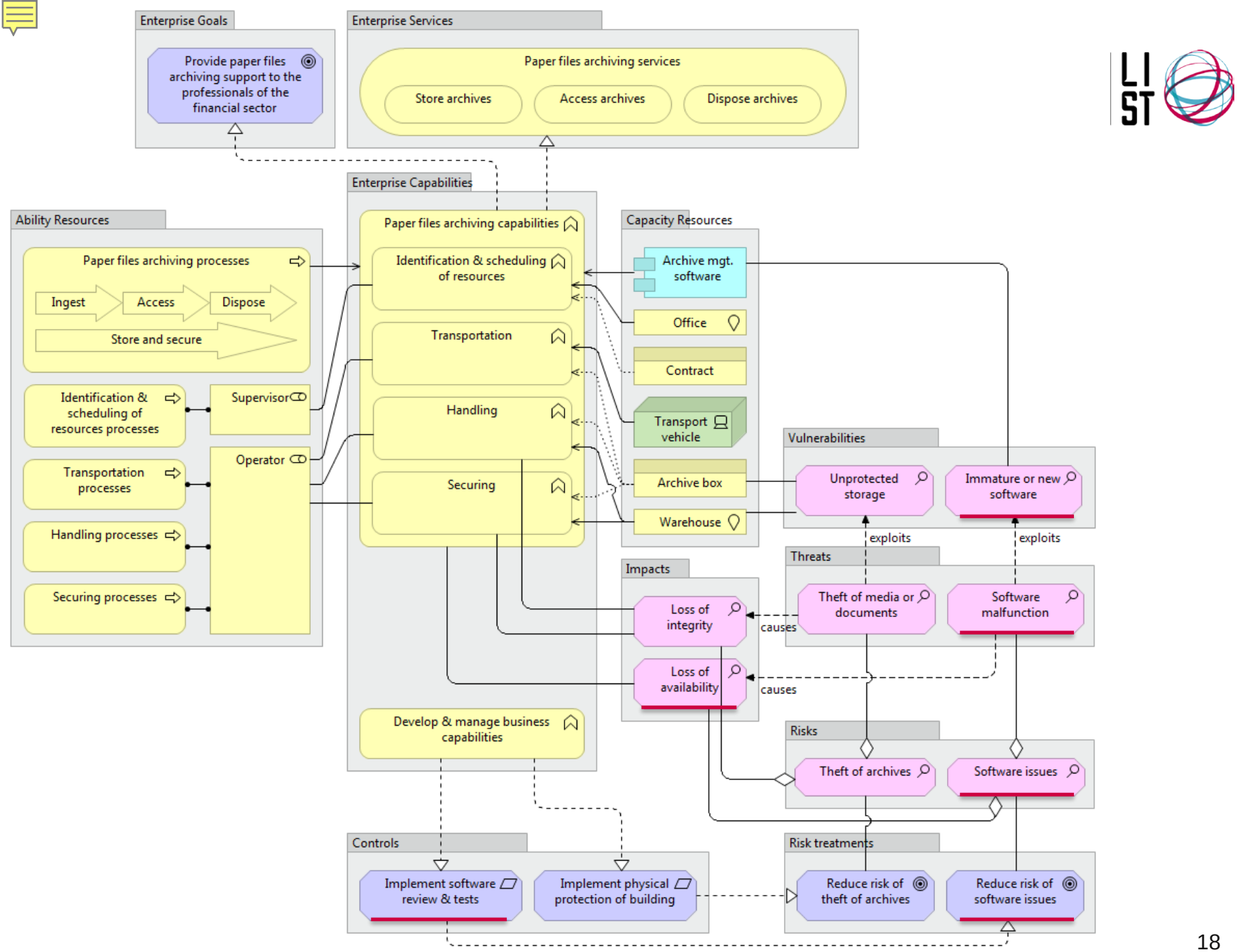
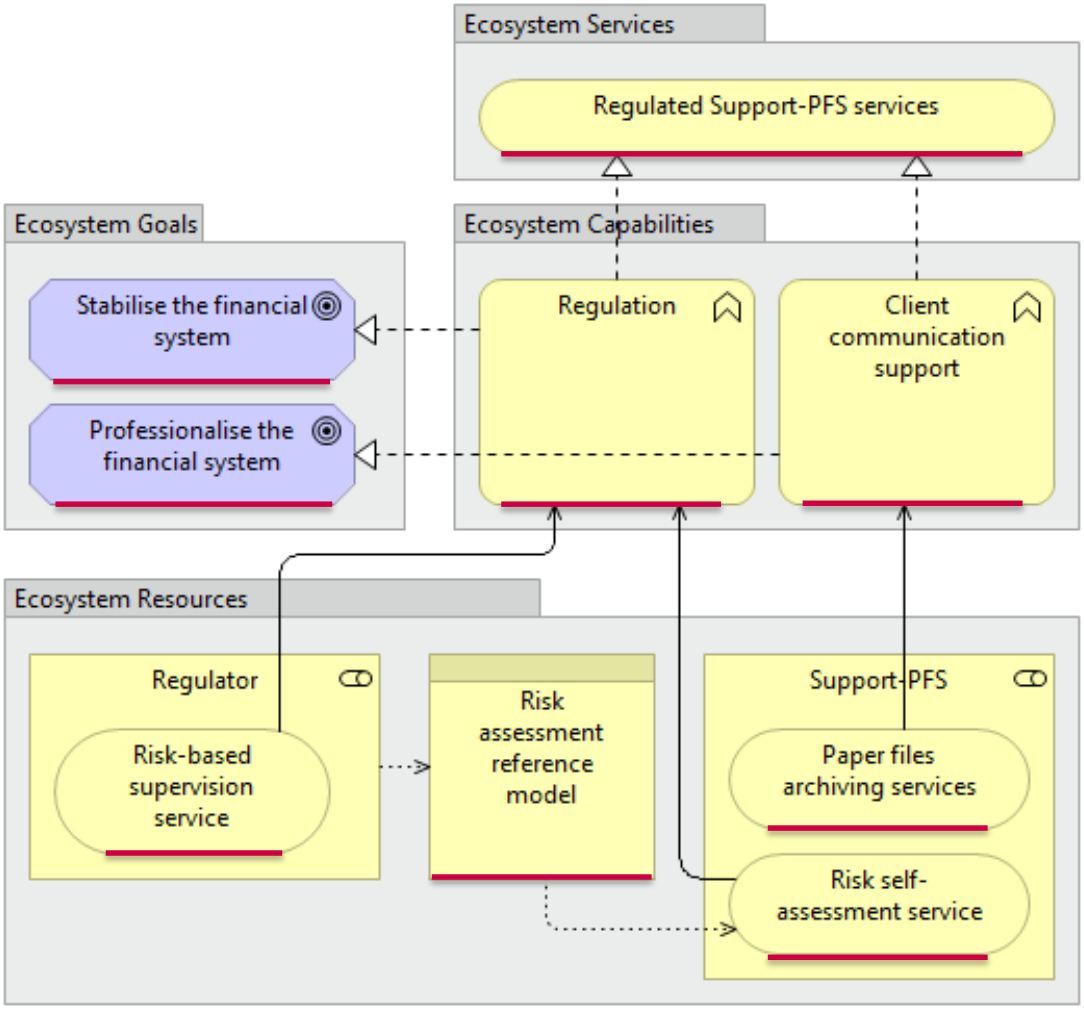
Use case: Paper files archiving services




Enterprise Goals
Provide paper files archiving support to the professionals of the financial sector
Enterprise Services
Paper files archiving services
Store archives
Access archives
Dispose archives
Enterprise Capabilities
Ability Resources
Paper files archiving processes
Ingest
Access
Dispose
Store and secure
Identification & scheduling of resources processes
Supervisor
Transportation processes
Operator
Handling processes
Securing processes
Paper files archiving capabilities
Identification & scheduling of resources
Transportation
Handling
Securing
Develop & manage business capabilities
Capacity Resources
Archive mgt. software
Office
Contract
Transport vehicle
Archive box
Warehouse
Vulnerabilities
Unprotected storage
Immature or new software
exploits
exploits
Threats
Theft of media or documents
Software malfunction
causes
Impacts
Loss of integrity
Loss of availability
causes
Risks
Theft of archives
Software issues
Controls
Implement software review & tests
Implement physical protection of building
Risk treatments
Reduce risk of theft of archives
Reduce risk of software issues

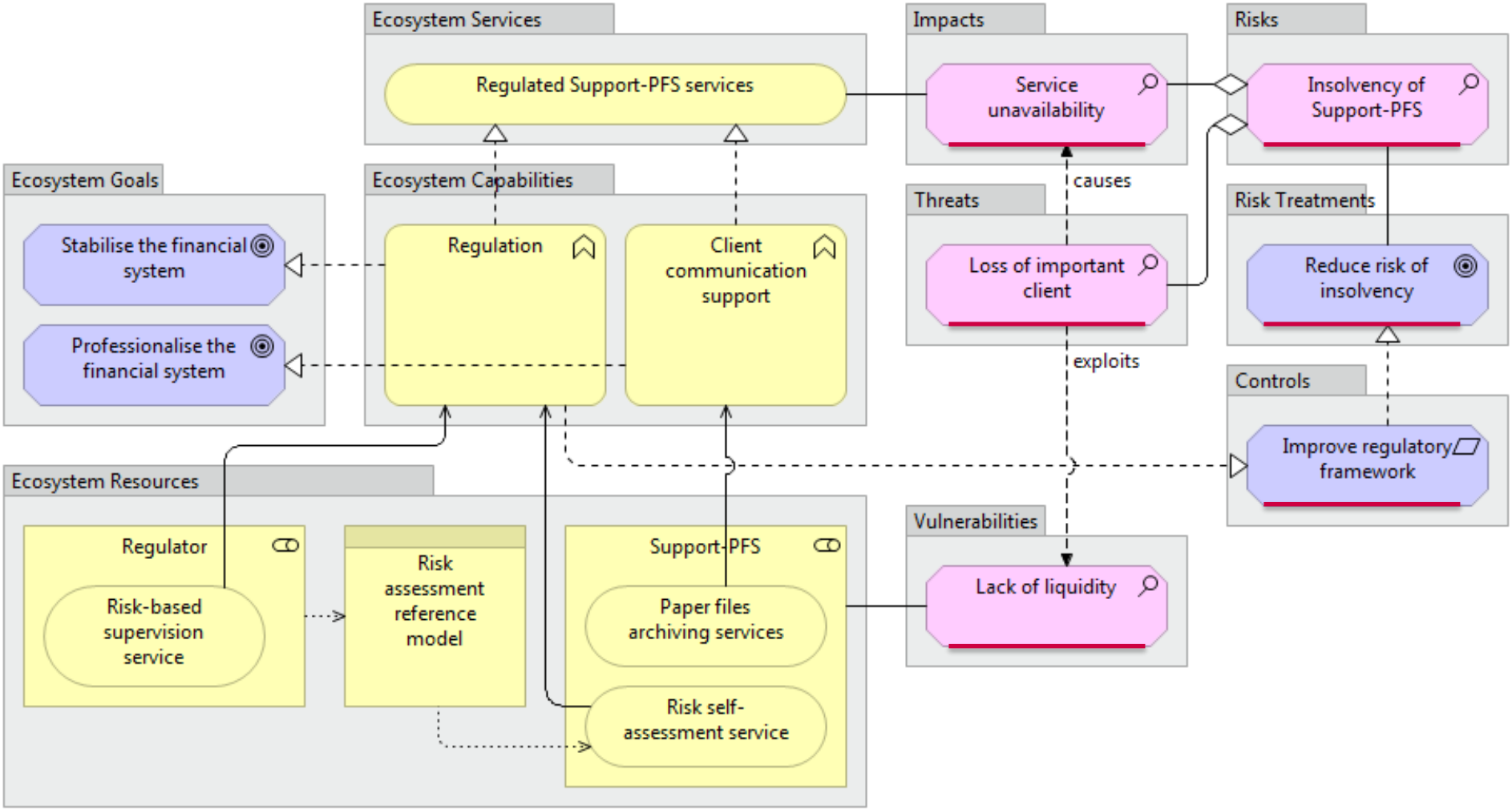
SYSTEMIC RISK LANGUAGE

Use case: Regulated Support-PFS services



SYSTEMIC RISK LANGUAGE

Use case: Regulated Support-PFS services



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CONCLUSION

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Our contributions

Risk management at system level:

- The BSE metamodel built from the capability-resource pattern
- The ISSRM – BSE mapping
- The ArchiMate language extension to represent the risk management

We have demonstrated:

- The use of a few concepts to model a complex ecosystem
- Risk management at enterprise level can be raised at ecosystem level (fractal pattern)
- The Archimate mapping brings a language and the link between risk management and enterprise architecture

CONCLUSION

New perspectives and future work

Future work:

- Deepening the relationship between enterprise risk and systemic risk
- Deepening the role of the service as a hyphen between both levels
- Improving the variability aspect by raising the context to the ecosystem level

New perspectives:

- Extension to other purposes than risk management (business alignment, process assessment, compliance)
- Extension to systems with many regulators
- Extension outside the boundaries of the ecosystem (link regulators from multiple ecosystems)

THANK YOU FOR LISTENING

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Questions?

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